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EXAMINER	
JONES, DAVID	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	09/521,850	OHTA ET AL.	
	Examiner	Art Unit	
	David L Jones	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 August 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: Fig. 2B, item 7A. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3, 5-9, 21-23, 32, 33, 36, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andresen et al. (US 5,659,407).

Regarding claims 1, 32 and 33, Andresen teaches an image processing apparatus, method and computer system comprising:

An interpreter (fig. 1, #16, column 3, lines 55-67, and column 4, lines 1-10) that receives the image data and issues calls which cause the desired image to be drawn, or printed on the paper. These calls can be of two basic types. One set of calls identifies the appearance state of the objects to be drawn. The appearance state indicates the color of the object, as well as other appearance-related factors, such as patterns or the like. The other set of calls describes the object to be drawn, such as a rectangle, a particular character or text, or the like. Such description might include the location of the object in the image, as well as its size. Therefore, with respect to the attribute information generation means the interpreter is providing the same function.

The interpreter controls the image processing that has been held in a frame buffer #22 at this time the pixel data values can undergo optional processing within one or more image processors #24.

In operation, the interpreter 16 issues a call to set the state of the printer to print the color cyan, and then issues a call to draw the rectangle (fig. 2, 30, column 4, lines 49-64). In response to the calls to draw the cyan rectangle 30, the renderer 20 stores information in the frame buffer section 22C which identifies each pixel in the image that is to contain the color cyan. This stored information includes the saturation value, or intensity, for the displayed color at the respective pixel. The renderer 20 operates in a similar manner for the calls pertaining to the drawing of the magenta rectangle 32 and the yellow rectangle 34. In particular, information pertaining to the saturation value of the magenta rectangle 32 is stored at appropriate address locations in the magenta section 22M of the frame buffer, and saturation values for the yellow rectangle 34 are

stored in the yellow section 22Y of the frame buffer. As can be seen from figure 2, all three rectangles having overlapping edges and from above explanation, it is obvious to one skilled in the art at the time the invention was made that Andresen has taken into consideration different call aspects for both shape and color and/or pattern of both a first image 32, and a second image 34 with respect to the overlapping edges.

The renderer (fig. 1, #20, column 4, lines 11-64) converts the image data from the interpreter into individual pixel display values. These values are supplied to a print engine #26, to control raster image generation and the actual printing. It would have been obvious to one skilled in the art at the time the invention was made that by definition a rastered image is a bitmap image.

Andresen states that in the operation of an exemplary imaging system, the user, might be running a graphics application program on a computer (column 1, lines 25-67).

Regarding claim 3, Andresen teaches an image processing apparatus that at render time (FIG. 5B, column 6, lines 48-62), the frame buffer array is created at step 54, with pointers to the three frame buffer sections, to be referenced by the print engine. As data is retrieved from the display list 18 for one of the image areas, at step 56, the achromatic state flag is examined at step 58 for its corresponding area. If the flag is set to the false condition, the data for that area is rendered into three distinct frame buffer sections at step 60, and the frame buffer array is loaded with pointers to each of the three respective frame buffer sections at step 62. Alternatively, if the area's achromatic state flag is true, the data is rendered into a single frame buffer section at step 64, and the frame buffer array is set at step 65 so that the pointer to the single frame buffer

section into which the rendering took place is copied for all three components, as shown in FIG. 3b.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made that by copying the frame array at the time the raster image data is copied for achromatic image instead of being overwritten but it performing the same function.

Regarding claim 5, Andresen teaches an image processing apparatus, which includes a method and system for rendering achromatic images for printing. Andresen in column 4, lines 11-21, that the pixel display values can be compressed and/uncompressed, or undergo half-toning processing.

Regarding claim 6, Andresen teaches an image processing apparatus, which includes a method and system for rendering achromatic images for printing. In column 6, lines 48-62, that in fig. 5B, the frame buffer array is created at step 54, with pointers to the three frame buffer sections, to be referenced by the print engine. As data is retrieved from the display list 18 for one of the image areas, at step 56, the achromatic state flag is examined at step 58 for its corresponding area. If the flag is set to the false condition, the data for that area is rendered into three distinct frame buffer sections at step 60, and the frame buffer array is loaded with pointers to each of the three respective frame buffer sections at step 62. Alternatively, if the area's achromatic state flag is true, the data is rendered into a single frame buffer section at step 64, and the frame buffer array is set at step 65 so that the pointer to the single frame buffer section into which the rendering took place is copied for all three components, as shown in FIG. 3b. The above detailed operation if true is an “and function” and if false is an “or function”.

Regarding claim 7, Andresen teaches an image processing apparatus, which includes a method and system for rendering achromatic images for printing. Andresen teaches in column 4, lines 11-21, that the print engine could be of the laser beam type or the ink jet type.

Regarding claim 8, Andresen teaches an image processing apparatus, which includes a method and system for rendering achromatic images for printing. In column 4, lines 49-56, the interpreter 16 issues a call to set the state of the printer to print the color cyan, and then issues a call to draw the rectangle (fig. 2, 30, column 4, lines 49-64). In response to the calls to draw the cyan rectangle 30, *the renderer 20 stores information in the frame buffer section 22C which identifies each pixel in the image that is to contain the color cyan. This stored information includes the saturation value, or intensity, for the displayed color at the respective pixel.* The renderer 20 operates in a similar manner for the calls pertaining to the drawing of the magenta rectangle 32 and the yellow rectangle 34. In particular, information pertaining to the saturation value of the magenta rectangle 32 is stored at appropriate address locations in the magenta section 22M of the frame buffer, and saturation values for the yellow rectangle 34 are stored in the yellow section 22Y of the frame buffer. As can be seen from figure 2, all three rectangles having overlapping edges and from above explanation, it is obvious to one skilled in the art at the time the invention was made that Andresen has taken into consideration different call aspects for both shape and color and/or pattern of both a first image 32, and a second image 34 with respect to the overlapping edges.

Regarding claims 21, 36, and 37, Andresen teaches an image processing apparatus, method and computer programming code comprising:

input means for inputting image data composed of a plurality of objects as seen in FIG. 2, column 4, lines 26-36, an exemplary document 28 to be printed on the printer contains four objects. For the sake of simplicity, these object are represented as solid rectangles. In practice, the object can be any geometric shape, lines, or characters of text. In this particular example, each object has a different color, as represented by the different shading. The rectangle 30 is cyan, the rectangle 32 is magenta, the rectangle 34 is yellow, and the rectangle 36 is black;

rendering means for rendering the objects into bitmap image data, as shown in fig. 1, column 4, lines 11-21, the information on the display list is provided to a renderer 20. The renderer converts the image data from the interpreter 16 into individual pixel display values, which are stored in a frame buffer 22. The pixel display values stored in the frame buffer can undergo optional processing within one or more processors 24. For example, the display values can be compressed and/or decompressed, or undergo halftone processing. Further, it would have been obvious to one skilled in the art at time the invention was made that by definition a bitmap is a block of memory that stores a raster image of pixels in a device-specific format, in which the characteristics of each pixel are determined by a set of bits.

generation means for generating attribute map information indicating a configuration of the bitmap image data on the basis of the bitmap image data rendered by said rendering means and attributes of the objects as such in column 4, lines 37-56, teach that the frame buffer (fig. 2, #22) is comprised of three sections, or address spaces, 22C, 22M and 22Y, which respectively correspond to the three color components of the printer's color space. In essence, each section comprises a pixel map, having a storage location for each pixel in the image to be generated, as represented by the grid marks along the edges of each plane. In the illustration, the sections of

the frame buffer are shown as separate planes. In practice, the color component information for the pixels can be stored in any desired form. For example, the three color component values for a pixel can be stored together as three contiguous bytes in the memory. In operation, the interpreter 16 issues a call to set the state of the printer to print the color cyan, and then issues a call to draw the rectangle 30. In response to the calls to draw the cyan rectangle 30, the renderer 20 stores information in the frame buffer section 22C, which identifies each pixel in the image that is to contain the color cyan. This stored information includes the saturation value, or intensity, for the displayed color at the respective pixel; and

determination means for determining a range of the bitmap image data, which is to undergo a predetermined image process, on the basis of the attribute map information generated by said generation means, is shown in column 4, lines 49-64, in operation, the interpreter (fig. 1, 16) issues a call to set the state of the printer to print the color cyan, and then issues a call to draw the rectangle (fig. 2, #30). In response to the calls to draw the cyan rectangle 30, the renderer 20 stores information in the frame buffer section 22C which identifies each pixel in the image that is to contain the color cyan. This stored information includes the saturation value, or intensity, for the displayed color at the respective pixel. The renderer 20 operates in a similar manner for the calls pertaining to the drawing of the magenta rectangle 32 and the yellow rectangle 34. In particular, information pertaining to the saturation value of the magenta rectangle 32 is stored at appropriate address locations in the magenta section 22M of the frame buffer, and saturation values for the yellow rectangle 34 are stored in the yellow section 22Y of the frame buffer.

Regarding claim 22, Andresen teaches an image processing apparatus wherein the image process is an image area separation as seen in Fig. 2, column 4, lines 26-64).

Regarding claim 23, Andresen teaches an image processing apparatus wherein the attribute (calls) map information includes a bitmap flag (achromatic state flag), as taught in column 6, lines 32-47, a page of image data is divided into one or more non-overlapping areas, an achromatic state flag is set to the true state for each area of black of the image and false for each area that requires a change in color.

5. Claims 9-14, 34, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa (US 5,436,981).

Regarding claim 9, 34 and 35, Ishikawa teaches an image processing apparatus, method and computer programming code comprising:

discrimination means (fig. 1, #2, column 7, lines 1-12) for discriminating a type of object to be rendered, the identifying circuit determines from the information on an image is a bitmap command or a image command;

determination means (fig. 1, #5, column 7, lines 13-23) determines the presence or absence of synthesis of the discriminated object, the data separating circuit (b) # 5 separates the bitmap information from the command identifying circuit #2 into layout information, paint-tone color data and bitmap data representing a character or line drawing. The data separating circuit outputs the separated layout information to memory controller (a) #10 and an overlap decision circuit 19, outputs the separated bitmap data to a bitmap memory #9 constituted by a RAM or the

like, and outputs the paint-tone color data to a block-tone memory #11 constituted by a Ram or the like;

synthesis means (fig. 1, #16, column 8, lines 50-57) for synthesizing an object and utilizing the information of the type of object in accordance with the determination result, therefore, as can be seen memory controller (a) #10 performs control in such a manner that the data stored in the bitmap memory #9 and block-tone memory #11 is read out in synchronism with the engine synchronizing signal. The bitmap data and tone data read out is mixed with the image data by a mixing circuit #16, and the resulting mixed image is output to the printer engine from a terminal #18, which as is well known in the art that upon mixing two types of images is performing a image synthesis;

processing means (fig. 5, #31, column 11, lines 24-68) as shown in FIG. 5, the mixing circuit 16 includes a shift register 30 to which the bitmap data or positional information from the bitmap memory 9 is input by the memory controller (a) 10 in byte units in synchronism with the engine synchronizing signal. The shift register 30 subjects the bitmap data or positional information, which has entered in byte units, to a parallel-to-serial conversion to form a selection signal applied to a selector 31. The selector 31 has a terminal A to which the paint-tone (color) data or tone information from the block-tone memory 11 is input by the memory controller (a) 10 in synchronism with the engine synchronizing signal, and a terminal B to which the raster image from the rasterizing circuit 15 is input by the memory controller (a) 10 in synchronism with the engine synchronizing signal. In conformity with the selection signal that has entered from the shift register 30, the selector 31 selects and delivers either the tone data applied to the terminal A or the raster image applied to the terminal B. The selector 31 selects

the tone data when the control signal is "1" and the raster image when the control signal is "0". The mixing circuit 16 outputs the tone data, which has been stored in the block-tone memory 11, for a pixel corresponding to stored data "1" in the bitmap memory 9, and outputs the raster image (decoded image data) for a pixel corresponding to stored data "0" in the bitmap memory 9. However, the mixing circuit 16 outputs white with regard to the area outside the image area. More specifically, the paint-tone (color) data stored in the block-tone memory 11 by the bitmap command is output for a pixel for which data "1" has been stored in the bitmap memory 9 by the bitmap command. Further, as for a pixel extracted by the character/line-image extracting circuit 6, data "1" has been stored in the bitmap memory 9 and the tone (color) information thereof has been stored in the block-tone memory 11. Therefore, the extracted pixel is restored by the mixing circuit 16 to the tone data that prevailed prior to the substitution performed by the extracted-pixel substitution circuit 7. As noted above the selector #31 is performing the processing in conjunction with the mixing circuit to append the information of an image.

Regarding claim 10, Ishikawa teaches an apparatus that includes: that the type of object to be rendered includes information indicating if an is a bitmap as shown in column 7, lines 1-12, that the information applied at the terminal (fig. 1, 1) determines whether the information is a bitmap or an image command.

Regarding claim 11, Ishikawa teaches an apparatus that includes: wherein the type of object to be rendered includes information indicating if an object is a color or monochrome object as shown in column 7, lines 13-23, the data separating circuit separates the bitmap information from the command identifying circuit into layout, information, paint-tone (color) data and bitmap data representing a character or line drawing (monochrome).

Regarding claim 12, Ishikawa teaches an apparatus that includes: wherein the type of object to be rendered includes information indicating if an object is a character or an object other than the character as shown in column 7, lines 13-23, the data separating circuit separates the bitmap information from the command identifying circuit into layout, information, paint-tone (color) data and bitmap data representing a character or line drawing (monochrome).

Regarding claim 13, Ishikawa teaches an apparatus that includes: wherein the type of object to be rendered includes information indicating if an object is a tone as shown in column 10, lines 9-25, depending upon the computer or the like, a character or line drawing added to a natural image is unrelated to the background of the natural image, and therefore the tone of the mixed image becomes discontinuous. Further, the tone of the added character or line drawing usually is the same within a specific area. On the other hand, a natural image such as a photograph exhibits a high degree of correlation between pixels, and there is a tendency for the tone distribution to spread out owing to noise, which is impressed upon the image when it is read by an image scanner, or as a result of a shading correction. Accordingly, the pixel of an added character or line drawing can be extracted by detecting a tone in which the tone distribution has no spread and the frequency of occurrence is greater than a predetermined threshold value.

Regarding claim 14, Ishikawa teaches an apparatus that includes: image-processing means for performing an image process of data of the rendering result in accordance with the information of the type of object as shown in column 7, lines 1-12, that the information such as a bitmap command or an image command enters a terminal 1 from an external host computer or formatter (not shown). The terminal 1 is connected to a command identifying circuit 2 which,

based upon an identification code contained in the information applied via the terminal 1, determines whether the information is a bitmap command or an image command, outputs information identified as being a bitmap command to a data separating circuit (b) 5 and outputs information identified as being an image command to a data separating circuit (a) 3.

6. Claims 2 & 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andresen et al. as applied to claim 1 above, and further in view of Shimizu et al. (US 5,483,361).

Regarding claim 2, Andresen teaches an image processing apparatus, which includes a method and system for rendering achromatic images for printing. Andresen teaches in column 4, lines 11-21, that the pixel display values stored in the frame buffer can undergo optional processing within one or more processors 24. But does not explicitly detail that the image process is a resolution converting process. Whereas, Shimizu teaches that within the black character correcting circuit (fig. 8, #80, column 5, lines 25-59) includes a selector 83, that outputs a signal E1', which is sent to the comparator (fig. 9, #81) the comparator outputs a 0 for low resolution and a 1 for high resolution, which would function as a resolution converting process.

At the time of the invention, it would have been obvious to one skilled in the art to combine the resolution converting process as taught by Shimizu with the renderer of Andresen.

The suggestion/motivation for doing so would have been to allow for a change in resolution being sent to the printer.

Therefore, it would have been obvious to combine Andresen et al. with Shimizu et al. to obtain the invention as specified in claim 2.

Regarding claim 4, Andresen teaches an image processing apparatus, which includes a method and system for rendering achromatic images for printing. Andresen in column 4, lines 11-21, that the pixel display values can be compressed and/uncompressed, or undergo half-toning processing, which is well known in the art as a dither process.

Shimizu teaches that in column 5, lines 29-33, that the CMYK calculating circuit (fig. 7, #81) includes therein a circuit for converting R, G and B signals into Ye, M and C signals, a color masking circuit, and a circuit for performing a UCR process and outputting the black (Bo) signal. And in column 8, lines 13-26, that in FIG. 11 shows the black character correcting circuit using a binarization process that includes a dither processing circuit 104 performs a known dither process if only the output of the printer line number generating circuit 103 is 0, and it passes the inputted signal without processing it if the output of the circuit 103 is 1.

7. Claims 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa as applied to claims 9-14 above, and further in view of Shimizu et al. (US 5,483,361).

Regarding claim 15, Ishikawa teaches an apparatus that in column 7, lines 13-23, the data separating circuit separates the bitmap information from the command identifying circuit into layout, information, paint-tone (color) data and bitmap data representing a character or line drawing (black character). Ishikawa does not explicitly detail a binarization process or filter process.

However, Shimizu et al. teaches in column 7, lines 59-67, and column 8, lines 1-4, shows in Fig. 10 that the black character correcting circuit using a binarization process. A circuit #91 calculates cyan (Co), magenta (Mo), yellow (Yo) and black (Ko) signals based on the R, G and B signals by using a known technique. An AND gate #92 outputs 1 if the black level signal T takes a value other than 1 and the image area signal takes a value 0, and outputs 0 in the other cases. A printer line number determining circuit #93 determines the number of printer lines based on the output of the AND gate #92 for the object pixel and associated pixels. Selectors 94, 95, 96 and #97 output 0, 0, 0 and Ko respectively if the printer line number signal P is 1, and output Co, Mo, Yo and 0 respectively if the signal P is 0. And in column 3, lines 23-32, that the Red (R), green (G) and blue (B) color signals for one pixel of a color document are read with a color document reader made of a CCD 1 to which a mosaic filter is attached. Further, it is well known in the art that a black character process including binarization includes a filtering process.

Ishikawa and Shimizu are analogous art because they both are from the same field of endeavor, image processing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the binarization process and filtering process with the black character process of Ishikawa.

The suggestion/motivation for doing so would have been to provide a black character processing near an area derived character image and line image are having an optional color, and the filtering process allows the CCD to output a dot sequential color signal which is amplified by an amplifier and color separated in R, G, B signals.

Therefore, it would have been obvious to combine Ishikawa with Shimizu to obtain the invention as specified in claim 15.

Regarding claim 16, Ishikawa teaches an apparatus that allows for black character separation, but does not explicitly disclose that the image processing will output rendered data using black alone when it is determined that the information of the object is a black character.

Whereas, Shimizu teaches in column 5, lines 25-36, that a CMYK calculating circuit (fig. 8, #81) calculates cyan (Co), magenta (Mo), yellow (Yo) and black (Ko) signals based on the R, G and B signals by using a known technique. The CMYK calculating circuit 81 includes wherein a circuit for converting R, G and B signals into Ye, M and C signals, a color masking circuit, and a circuit for performing a UCR process and outputting the black (Bo) signal. An AND gate #82 receives the black level signal T and image area determining signal Z, and outputs 1 if the black level signal is not 0 and the image area determining signal is 0, and outputs 0 in the other cases.

Regarding claim 17, Ishikawa teaches an apparatus wherein the synthesis means synthesizes the object according to an "or" mode dictated by the selector #31 selects and delivers either the tone data applied to the terminal A or the raster image applied to the terminal B.

Regarding claim 18, Ishikawa teaches an image processing apparatus with synthesis means, but does not explicitly detail that the synthesis is inhibited upon receiving a synthesis command. Ishikawa does teaches a synthesis means (fig. 1, #16, column 8, lines 50-57) for synthesizing an object and utilizing the information of the type of object in accordance with the determination result, therefore, as can be seen memory controller (a) #10 performs control in

such a manner that the data stored in the bitmap memory #9 and block-tone memory #11 is read out in synchronism with the engine synchronizing signal. The bitmap data and tone data read out is mixed with the image data by a mixing circuit #16, and the resulting mixed image is output to the printer engine from a terminal #18, which as is well known in the art that upon mixing two types of images is performing a image synthesis.

Further, in column 12, lines 8-36, FIG. 6 is a diagram illustrating an example of the layout of the bitmap data and image data according to this embodiment. In this example, bitmap data is written in areas i, j by bitmap commands i, j, and image data is written in area k by an image command k. In a case where extraction of a character/line-image has been performed with regard to a block having the overlapping hatched portions (overlapping areas) shown in FIG. 6, a problem arises in that the bitmap data of the overlapping areas stored in the bitmap 9 is destroyed. The purpose of the overlap decision circuit 19 is to prevent this destruction of the bitmap data. A starting address (X.sub.si, Y.sub.si) and end address (X.sub.ei,Y.sub.ei) of the area i and a starting address (X.sub.sj,Y.sub.sj) and end address (X.sub.ej,Y.sub.ej) of the area j are set in the overlap decision circuit 19 prior to entry of the image command k. When the image command k is applied thereto, the overlap decision circuit 19 compares an address (x,y) of the block of interest input from the memory controller (a) 10 with the four addresses mentioned above. If even one address satisfying the following relations is found to exist, the block of interest is judged to be an overlapping block:

(1) X.sub.si .ltoreq.x.ltoreq.X.sub.ei and Y.sub.si .ltoreq.y.ltoreq.Y.sub.ei

(2) X.sub.sj .ltoreq.x.ltoreq.X.sub.ej and Y.sub.sj .ltoreq.y.ltoreq.Y.sub.ej

Accordingly, the character/line-image extracting circuit 6 does not perform character/line-image extraction with regard to the block having the overlapping areas in FIG. 6, and therefore the bitmap data of the overlapping areas stored in the bitmap memory 9 is preserved. Which as would have been well known in the art at the time the invention was made the system has performed an inhibit command to preserve the information in an overlapping area for printing.

Regarding claim 19, Ishikawa teaches an image processing apparatus with synthesis means, but does not explicitly detail that the synthesis is inhibited upon receiving a synthesis command. Ishikawa does teaches a synthesis means (fig. 1, #16, column 8, lines 50-57) for synthesizing an object and utilizing the information of the type of object in accordance with the determination result, therefore, as can be seen memory controller (a) #10 performs control in such a manner that the data stored in the bitmap memory #9 and block-tone memory #11 is read out in synchronism with the engine synchronizing signal. The bitmap data and tone data read out is mixed with the image data by a mixing circuit #16, and the resulting mixed image is output to the printer engine from a terminal #18, which as is well known in the art that upon mixing two types of images is performing a image synthesis.

Further, in column 12, lines 8-36, FIG. 6 is a diagram illustrating an example of the layout of the bitmap data and image data according to this embodiment. In this example, bitmap data is written in areas i, j by bitmap commands i, j, and image data is written in area k by an image command k. In a case where extraction of a character/line-image has been performed with regard to a block having the overlapping hatched portions (overlapping areas) shown in FIG. 6, a problem arises in that the bitmap data of the overlapping areas stored in the

bitmap 9 is destroyed. The purpose of the overlap decision circuit 19 is to prevent this destruction of the bitmap data. A starting address (X.sub.si, Y.sub.si) and end address (X.sub.ei, Y.sub.ei) of the area i and a starting address (X.sub.sj, Y.sub.sj) and end address (X.sub.ej, Y.sub.ej) of the area j are set in the overlap decision circuit 19 prior to entry of the image command k. When the image command k is applied thereto, the overlap decision circuit 19 compares an address (x,y) of the block of interest input from the memory controller (a) 10 with the four addresses mentioned above. If even one address satisfying the following relations is found to exist, the block of interest is judged to be an overlapping block:

(1) X.sub.si <= x <=X.sub.ei and Y.sub.si <= y <= Y.sub.ei

(2) X.sub.sj <= x <=.X.sub.ej and Y.sub.sj <= y <=Y.sub.ej

Accordingly, the character/line-image extracting circuit 6 does not perform character/line-image extraction with regard to the block having the overlapping areas in FIG. 6, and therefore the bitmap data of the overlapping areas stored in the bitmap memory 9 is preserved. Which as would have been well known in the art at the time the invention was made the system has performed an inhibit command to preserve the information in an overlapping area for printing. And further, the above is being accomplished within an external device such as a printer, and is well known in the art it could be accomplished within a print driver within a host computer as detailed in column 29, lines 25-29.

Regarding claim 20, Ishikawa teaches an image processing apparatus with synthesis means in accordance with the information of the type of object as shown in column 7, lines 1-12, that the information such as a bitmap command or an image command enters a terminal 1 from an external host computer or formatter (not shown). The terminal 1 is connected to a command

identifying circuit 2 which, based upon an identification code contained in the information applied via the terminal 1, determines whether the information is a bitmap command or an image command, outputs information identified as being a bitmap command to a data separating circuit (b) 5 and outputs information identified as being an image command to a data separating circuit (a) 3. Which as is well known in the art that an image and a bitmap image are normally two separate images or objects.

8. Claims 24-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andresen et al. as applied to claims 21-23 above, and further in view of Ishikawa.

Regarding claim 24, Andresen teaches an image processing apparatus wherein the attribute map information (pixel map or frame buffer) column 4, lines 37-56, each section of the frame buffer comprises a pixel map having a storage location for each pixel in the image to be generated with reference to color. Andresen does not explicitly teach that the two-dimensional coordinate position is held for each pixel of the image.

Whereas, Ishikawa teaches the two-dimensional coordinate position (positional information) is held in the bitmap memory as seen in fig. 12, #202 and #203.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the positional information of Ishikawa with the pixel map of Andresen.

The suggestion/motivation for doing so would have been to provide for exact location of each pixel within an image.

Therefore, it would have been obvious to combine Andresen with Ishikawa to obtain the invention as specified in claim 24.

Regarding claim 25, Andresen teaches an image processing apparatus wherein the attribute map information (pixel map or frame buffer) column 4, lines 37-56, each section of the frame buffer comprises a pixel map having a storage location for each pixel in the image to be generated with reference to color. Ishikawa teaches a bitmap memory and a block-tone memory that store all of the positional information and tone information of each pixel.

Regarding claim 26, Andresen and Ishikawa both teach an image processing apparatus that includes the ability to manage the image data in units of color and the information is added to the attribute information. Andresen details (column 4, lines 37-56) that the frame buffer is separated into separate planes of C, M, and K, which is not R, G, and B, but does state that the color component information for each pixel can be stored in any desired form. Ishikawa teach that the data separating circuit causes the color data to be stored in the block-tone memory. And in column 2, lines 46-65, Andresen states that the system can be utilized for either RGB or CMY.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made that the color information can be saved in the form of R, G, and B, just as easily as C, M, and Y.

Regarding claim 27, Andresen and Ishikawa both teach an image processing apparatus that includes the ability to manage the image data in units of color pixels and the information is added to the attribute information. Andresen details (column 4, lines 37-56) that the frame buffer is separated into separate planes of C, M, and K, which is not R, G, and B, but does state that the

color component information for each pixel can be stored in any desired form. Ishikawa teach that the data separating circuit causes the color data to be stored in the block-tone memory.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made that the color information can be saved in the form of R, G, and B, just as easily as C, M, and Y.

Regarding claim 28, Andresen and Ishikawa both teach an image processing apparatus that includes the ability to manage the image data in units of color and the information is added to the attribute information. Andresen details (column 4, lines 37-56) that the frame buffer is separated into separate planes of C, M, and K, which is not R, G, and B, but does state that the color component information for each pixel can be stored in any desired form. Ishikawa teach that the data separating circuit causes the color data to be stored in the block-tone memory.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made that the color information can be saved in the form of R, G, and B, just as easily as C, M, and Y.

Further, that the attribute information is appended to pixels of one or a plurality of the R, G, and B planes, which as taught by Andresen is that the C, M, and Y planes can be stored for a pixel together as three contiguous bytes in memory.

Regarding claim 29, the claim rejection is analogous to claim 28.

Regarding claim 30, Andresen teaches an image processing apparatus wherein the determination means comprises image area separation processing means for performing an image area separation process for the bitmap image data as taught in column 6, lines 13-31, a page of image data is divided into non-overlapping areas.

Regarding claim 31, Andresen teaches an image processing apparatus wherein the determination means comprises image area separation processing means for performing an image area separation process for the bitmap image data as taught in column 6, lines 13-31, a page of image data is divided into non-overlapping areas. Shown in FIG. 4, each area can comprise a horizontal band 42a-42e that encompasses a percentage of the image. While five such bands are shown in FIG. 4, in practice the page can be divided into any desirable number of areas. Further in this regard, the areas need not be horizontal bands. They can have any shape, as long as they are capable of covering the entire page. The data in the display list is sorted by area, and the analysis of the page to determine whether it contains achromatic data can be carried out on a band-by-band basis. In the example of FIG. 4, the first band 42a is all white, and therefore contains only achromatic data. The next three bands 42b, 42c and 42d are comprised of the colored objects 30, 32 and 34, and therefore undergo normal color image rendering process. The last band 42e, which includes the black rectangle 36, contains only achromatic data, and can therefore be processed in a streamlined manner, according to the present invention.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nicholson et al. (US 5,625,711) discloses a system for producing a raster image derived from coded and non-coded portions of a hybrid data structure from an input bitmap. Morikawa et al. (US 4,843,405) In a printer apparatus wherein information relating to character patterns to be printed is received from an external source and is analyzed and converted into intermediate coded data, which are stored into a temporary memory and are thereafter

successively read from the temporary memory to produce bit-map image data representative of the character patterns to be printed for each page of printed output, whereupon the bit-map image data is stored into a bit-map memory by referring to a font memory and the character patterns are printed on the basis of the bit-map image data read from the bit-map memory for each page of printed output

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L Jones whose telephone number is (703) 305-4675. The examiner can normally be reached on Monday - Friday (7:00am - 3:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Coles can be reached on (703) 305-4712. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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